NASA
Launch Services Program (LSP)

2019 Astrophysics Explorers Mission of Opportunity – ESPA Class Rideshare Payloads (RPL)

Pre-Proposal Conference
MAY 2, 2019

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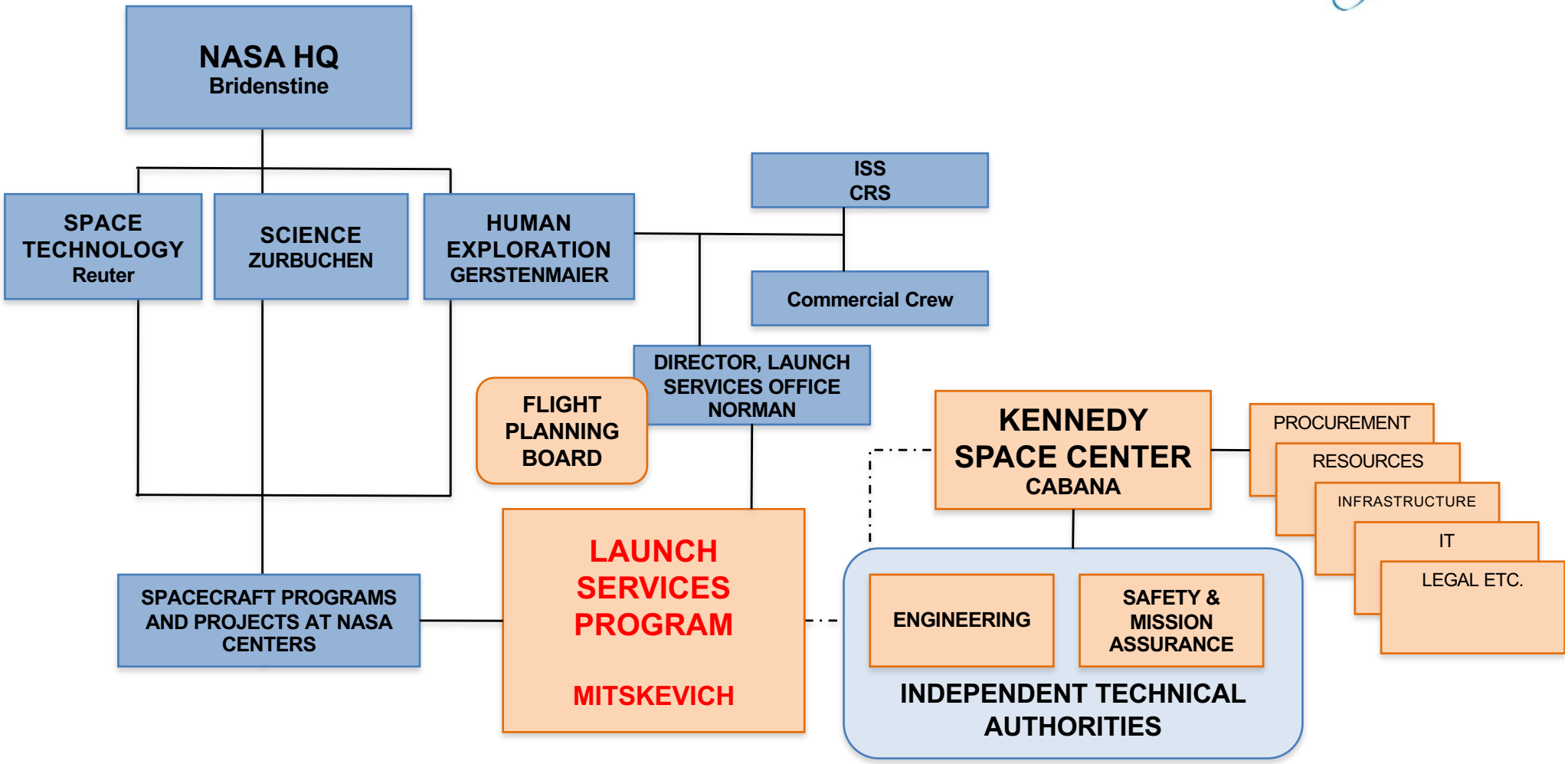
Launch Services Program Relationships (NASA/HEOMD/KSC)

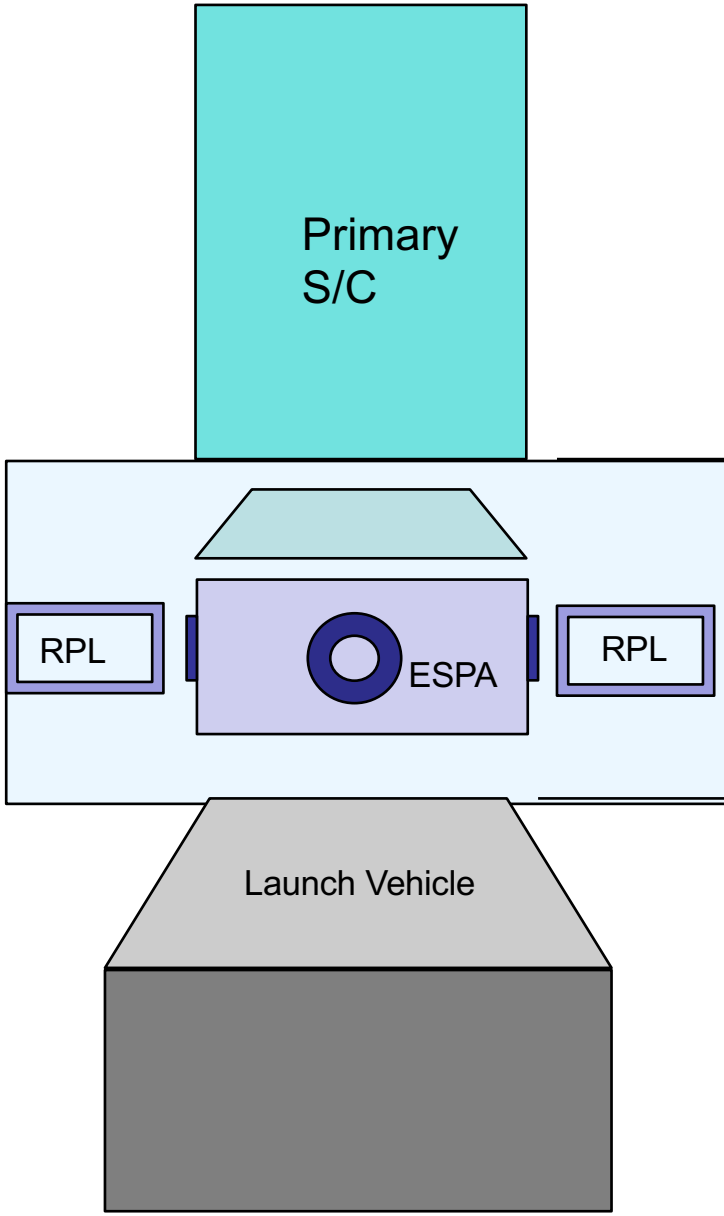


Launch Services Program

The Launch Services Program provides:

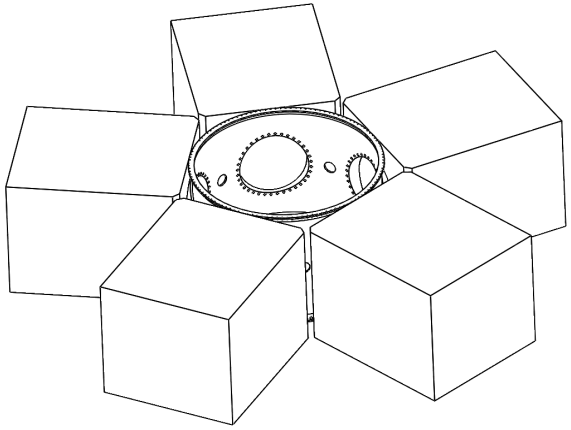
- Management of the launch service
- Technical oversight of the launch vehicle production/test
- Coordination and approval of mission-specific integration activities
- Mission unique launch vehicle hardware/software development
- Payload-processing accommodations
- Launch campaign/countdown management

ESPA Configuration

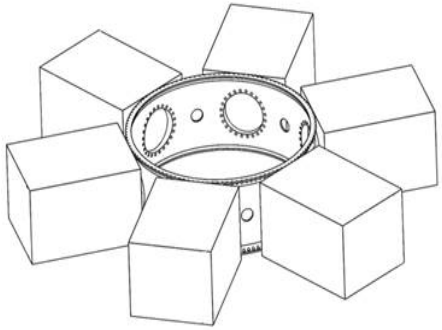


- LSP will procure the launch service for the Primary spacecraft and the ESPA ring through the Launch Service Task Order (LSTO) process
- LSP will coordinate the mission integration process with the Launch Service Contractor, the Primary spacecraft customer, and the ESPA mission aggregator
- A Mission Aggregator will be identified that will coordinate the mission the integration process with the RPLs
- The Aggregator will be the interface between LSP and the RPLs
- There will an ICD between each of the RPL and ESPA System
- The ESPA and RPLs will be integrated into one assembly and delivered to Launch Services Contractor
- The Launch Service Contractor is responsible for the build and check out of the launch vehicle with NASA involvement/insight

ESPA Interfaces

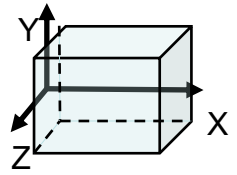


ESPA Grande



ESPA

ESPA	Max RPL Mass	Allowable RPL Volume	RPL Interface
ESPA Grande 5 Port	450 kg	42”x46”x38” Y, Z, X	24” circular
ESPA 6 Port	220 kg	24”x28”x38” Y,Z,X	15” circular



NASA will provide the Separation System as GFE: RUAG PAS 381S (15”) for ESPA
RUAG PAS 610S (24”) for ESPA Grande

Please see the 2019 ESPA Rideshare Users Guide (RUG) in the 2019 Astrophysics Explorers MO Program Library

RPL Do No Harm

All ESPA class RPL will be subject to a Do-No-Harm (DNH) assessment process to ensure that they will not pose a threat to the mission success of the Primary spacecraft or Launch Vehicle (LV) – Some general DNH considerations include:

- RPL Design
  - Design should be done to Aerospace standards including appropriate safety factors for tested and untested hardware
  - Design must physically comply with the space allotted and remain constrained and sufficiently stiff to not make contact with launch vehicle or other spacecraft hardware during flight
  - Dynamic modes of the auxiliary payload must be sufficiently understood and communicated to ensure no detrimental dynamic loading onto the launch vehicle or primary spacecraft
  - RPL must maintain integrity and not separate prematurely under worst case predicted loads and environments (acoustic, shock, vibe, thermal, depressurization)

RPL Do No Harm

- Flight Risks
  - Separation analysis must ensure no re-contact with the LV, Primary spacecraft, or other RPLs during RPL separation event(s)
  - RPL separation indications must be included in the LV telemetry stream
  - Mitigations are in place to ensure any potentially hazardous functions are redundantly inhibited until well after the RPL is clear of the LV, Primary spacecraft, or other RPLs
  - RPLs must not generate debris that may contact the LV, Primary spacecraft, or other RPLs
  - RPLs contamination sources must be understood and provided to the LV, Primary spacecraft, or other RPLs for impact assessment
  - RPLs must not generate environments (e.g. thermal, separation shock, etc.) which detrimentally impacts the qualification of the LV, Primary spacecraft, or other RPLs

RPL Do No Harm

- Launch Schedule Support
  - RPL integration schedules must support launch vehicle/primary payload integration schedules
  - RPLs must not impact the launch date for the primary mission in the event that the RPL is not able to support launch date – This is typically accomplished by having a mass simulator available and ready to integrate
  - RPLs must support the full launch window defined by the primary spacecraft

- Personnel Safety
  - RPLs must comply with applicable OSHA, DOT AFSPCMAN 91-710
  - RPLs must be stable and safe without services (power, commodities) once integrated

Please see the 2019 ESPA Rideshare Users Guide (RUG) in the 2019 Astrophysics Explorers MO Program Library

Documents

Applicable Documents	
AFSPCMAN 91-710	Range Safety User Requirements Manual Volume 3 – Launch Vehicle, Payloads, and Ground Support Systems Requirements
NPR 8715.6 NASA	Procedural Requirements for Limiting Orbital Debris
NASA-STD-6016	Standard Materials and Processes Requirements for Spacecraft
NPR 8715.6	NASA Procedural Requirements for Limiting Orbital Debris
2018-09-18-IMAP-ESPA-SIS	Specific Evolved Expendable Launch Vehicle Secondary Payload Adapter System Interface Specifications For Heliophysics Missions of Opportunity
Reference Documents	
N/A	***2019 Astro ESPA Rideshare Users Guide (RUG)***
EELV RUG	Evolved Expendable Launch Vehicle Rideshare User's Guide (SMC/LE)
TOR-2016-02946	Rideshare Mission Assurance and the Do No Harm Process –Aerospace Report
GSFC-STD-7000	General Environmental Verification Standard (GEVS) for GSFC Flight Program and Projects
MMPDS	Metallic Materials Properties Development and Standardization
MIL-HDBK-5	Military Handbook 5, Metallic Materials and Elements for Aerospace Vehicle Structures
MIL-STD-1540C	Military Standard Test Requirements for Launch, Upper-Stage, and Space Vehicles
NASA-STD-8719.24	NASA Expendable Launch Vehicle Payload Safety Requirements

Summary

- It is the Launch Service Program's goal to ensure the highest practicable probability of mission success while managing the launch service technical capabilities, budget and schedule
- Questions must be officially submitted to:

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LSP is ready to respond to your mission specific ESPA questions